

Geo Factsheet



Number 14

Social and Economic Effects of Changing Population Structure

The structure of most countries' population has undergone massive changes this century. These changes have knock-on effects on many aspects of society, from the composition and cohesion of the family unit to taxation and employment. This Factsheet will outline the nature and consequences of such structural changes using the UK, Japan, Nigeria and China as examples.

The population size of any given country is determined by:

- Birth rate
- Death rate
- Migration

These factors also determine the **structure** of the population - i.e. the proportion of the total population in each age group.

The structure of a population is illustrated by **population pyramids**. These will also reflect migration, "baby booms", disease and war.

The key aspects of the population pyramid which have social and economic consequences are:

- The sex balance
- The number of people aged under 15
- The number of people aged over 65

Table 1 outlines the key consequences of changes to the population structure. One numerical measure of this is the **Dependency ratio (DR)**; this is given by:

$$\frac{\text{No. of children (<15) + elderly (>65)}}{\text{No. of people of working age}} \times 100\%$$

Most developed countries have a dependency ratio of between 50 and 70 (i.e. for every 100 people of traditional working age, between 50 and 70 people are dependent upon them). Developing countries, often with very high birth rates and large numbers of children, may then have a dependency ratio well in excess of 100.

The DR can be a useful measure, but its utility is affected by the following limitations:

The assumption that all people of working age are working

This takes no account of the sick or unemployed, who are supported by the state (when welfare provision is in place) or their families. In many developed countries, most people remain in

formal education beyond the age of 15, so including such individuals in the working population is misleading.

The assumption that children and the elderly do not work

This is unlikely to be true in many developing countries; as discussed above, children are likely to be an economic asset to the family from an early age, and the elderly will most probably remain at work until physically incapable of it. As the proportion of elderly people in developed countries increases (see below), retirement at 65 is likely to cease to be the norm.

The equal weighting given to children and old people

In practice, the economic burden is unlikely to be identical.

Exam Hint - Many students lose marks by writing about total population size, population growth or distribution rather than what has been asked for i.e. structure. In recent decades migration has had a dramatic impact on the population structure of the migrant's home country. This will be considered in more detail in a future Factsheet.

Table 1. Key Aspects of Population Structure

Aspect	Low	High
Number of males per 100 females	Many women remain childless - reduced birth rate increases economic independence of women. <i>Reduced numbers of males could be due to war or migration.</i>	Substantial numbers of men unable to find a female partner - reduced birth rate. Possible increase in sex offences. Possible increase in urban unrest and 'gang' behaviour. At birth, ratio of M:F is 105:100. In the past this was evened out. In some countries, low status of women has led parents to selectively abort girls.
Proportion of people under 15	Proportion of fertile individuals will be low in immediate future. Decline in birth rate. Higher proportion of the population will be ageing. <i>3rd or 4th stage of demographic transition - developed countries.</i>	Large numbers of fertile individuals in the immediate future. High birth rate, very young population. Children likely to be required to be economically active. <i>1st or 2nd stage of demographic transition - developing countries.</i>
Proportion of people over 65	Most dependants are children. Either life expectancy is low or population is in a period of rapid expansion. <i>1st or 2nd stage of demographic transition - developing countries.</i>	Large numbers of old people are dependent - long life expectancy. High demands placed on welfare and medical services. <i>3rd or 4th stage of demographic transition - developed countries.</i>

Trends: Developed Countries

Medical developments have led to substantial global increases in life expectancy; worldwide, numbers of people over 60 and people over 80 have more than doubled since 1970. Most of this increase in numbers of the elderly is concentrated in the developed countries.

In the immediate future, it is predicted that the proportion of the population over 60 will remain roughly constant, but there will be a significant increase in those aged 85+. Hence, although increasingly people remain fit and active in "early" old age, the numbers of frail elderly people needing care is increasing. This is coupled with a reduction in birth rates and hence a decline in the working population. The main implications of this are:

Increased National Spending - hospitals, nursing homes, social security benefits, state pension provision.

Increased Tax Burden - a smaller working population will have to finance the increased spending.

Later Retirement - the decline in numbers of traditional working age combined with increased levels of health in 65-70 year olds is likely to make later retirement an option.

Growth in "Grey Power" - the increasing numbers of active people in "early" old age will begin to find their political feet (this is already in evidence in Florida, US) and take advantage of their post-retirement leisure to exert an increasing influence on decision-making.

Career Stagnation - delayed retirement of senior staff may block promotion for younger people, leading to frustration and demotivation.

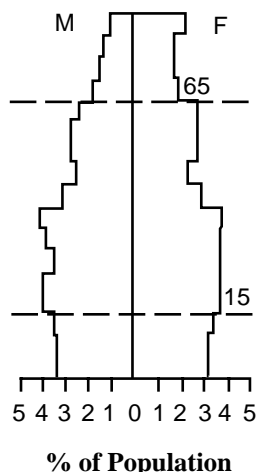
Employment Changes - more ancillary workers will be required in areas related to health and nursing care.

Internal Migration - the retired population traditionally moves away from the cities to more rural or leisure-based areas.

Increased Reliance on Families - the strain imposed on the welfare state is likely to lead to a reduction in provision, throwing the dependent elderly back onto their families. Many people will find themselves with a dependent elderly relative on their hands, which may impose greater strains on family relationships. In some cases, the needs of the dependent person may be such that the responsible relative will reduce their own hours of work.

Increased Reliance on Personal Financial Provision & Decreased Standard of Living among the Poorest Elderly- the likely reduction in state provision will encourage more people to make their own arrangements for a comfortable retirement. Those who cannot - and who have no relatives to rely on - are likely to find themselves in poverty.

Fig 1.



1987 FRANCE
A typical population pyramid of a highly developed country: relatively little variation between different age groups.

low birth rate, high death rate
post war baby boom

reduced birth rate

Trends: Developing Countries

The widening spread of improved healthcare and sanitation is effectively reducing the death rate in developing countries. The birth rate in many is still high - 31 births per 1000 population for developing countries, as compared with 12 per 1000 for developed countries; there are, however, signs that this is reducing. Currently, there are very high numbers of people aged 15 or below. There are also likely to be larger numbers of individuals surviving to old age which places an economic burden on their relatives. (The population structure cannot, of course, be considered in isolation; the increased industrialisation and urbanisation of many developing countries produce substantial socio-economic effects in their own right.) The main effects are:

Continued Population Increase in the Immediate Future - the sheer numbers of individuals in the fertile age range in the next two decades makes any reduction a difficult prospect.

Possible Imposition of Severe Population Restrictions - governments alarmed by the prospect of an increased population exhausting available resources may take draconian measures to limit families (see Factsheet No.4: 'Optimum Populations').

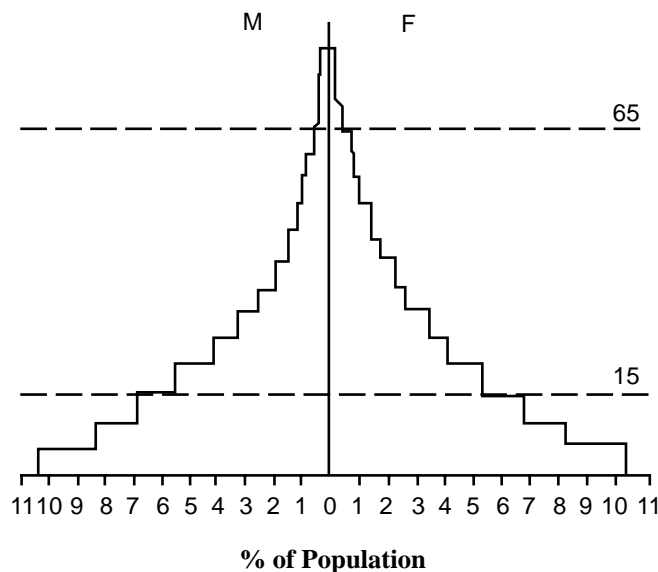
Pressure on Government Expenditure - education provision, in particular, is likely to be severely stretched, increasing class sizes and resulting in a higher proportion of children having little or no schooling. This develops into a vicious circle - lack of education is likely to produce high birth rates in the next generation.

Children Required to Work - lack of educational provision and the high child/adult ratio make it an economic necessity that in many poor families children should pay their way.

Internal and External Migration - large numbers of young people with few family commitments are more likely to migrate to areas of perceived greater prosperity.

Increased Unrest and Instability - high concentrations of young males in overcrowded cities is likely to increase crime.

Fig 2.



1990 KENYA
Over 50% of Kenya's population is under 15 years of age. As these people move into the fertile age range it may prove very difficult to prevent explosive population growth.

Case Study:

United Kingdom

As Figure 3 shows, the UK's population changed substantially in structure from 1971 to 1988, while changing little in total number. The number of school-age children declined by 20%, with a corresponding growth in the number of 25-44 year olds, and most dramatically, an increase of 46% in the number of people aged 75 or more. The magnitude of these changes was due to the "baby-boomers", who were born in the late fifties and early sixties, moving up through the population pyramid.

The implications of these changes were critical for public spending; there were increased pressures on higher education, increased unemployment and demands for new housing as well as the inevitable health-care needs of the elderly. The reduction in numbers of school-age children led to many schools being below their capacity, and a few being too small to be financially viable; disruption and public protest ensued when some were closed.

The move towards a declining population with an ageing profile looks set to continue (Fig 3 and 4), and the decline is faster than previously anticipated; the current predictions are below those of two years ago by 1 million in 2021 and almost 4 million lower in 2064.

Fig 3. UK population structure 1971-2061

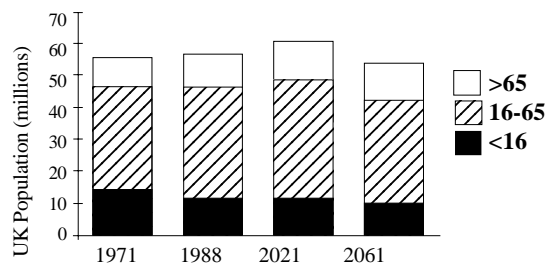
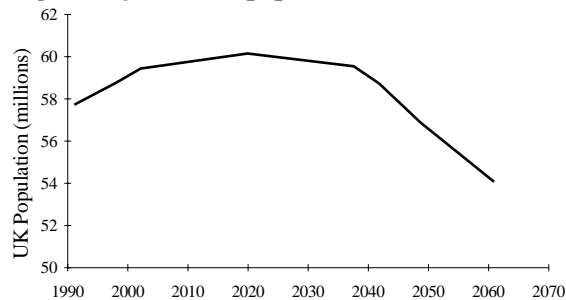


Fig 4. Projected UK population (HMSO 1996)



Case Study:

Japan

Between 1873 and 1937 Japan's population doubled from 35 million to 70 million. Since 1950 the rate of increase has fallen as the gap between birth rate and death rate has decreased. In 1995 the population had reached 125 million.

A major concern is that the percentage of the population aged 65 and over is expected to dramatically increase (see Fig 5). Japan already has the highest life expectancy in the world.

In 1995: Total population = 125m
 Population aged less than 65 = 110m
 Therefore population 65 or more = 125m - 110m = 15m
 or as a % = 12%

In 2010: Total population = 131m
 Population aged less than 65 = 103m
 Therefore population 65 or more = 131m - 103m = 28m
 or as a % = 21%

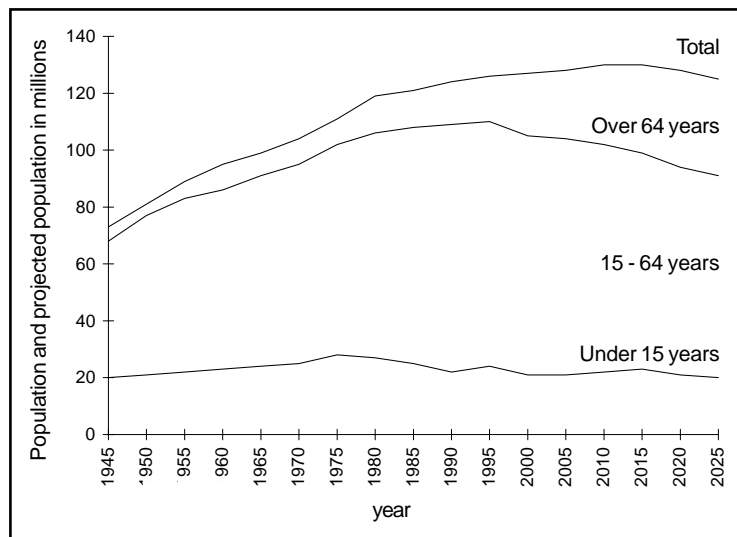
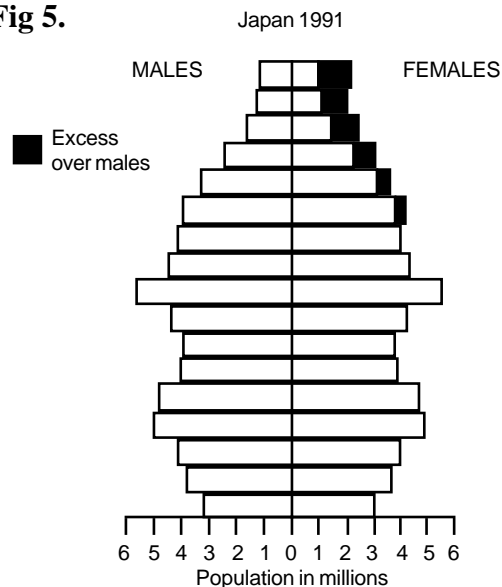


Fig 5.



**Case Study:
Nigeria**

Currently about 50% of Nigerians are under 20 years of age; the working population is about 30% of the total, giving a dependency ratio of 233%. Five years ago, demographers predicted that by 2015, Nigeria's population would jump from 115 million to 280 million; the latter figure is above the current population of the entire West Africa sub-region.

As Table 2 shows, Nigeria's demographers anticipated a huge increase in both number and proportion of the 10-24 age group. However, there have been significant changes in secondary school enrolment; In 1990 42% of males and 14% of females were enrolled at secondary school but by 1996 the corresponding figures had changed to 32% and 27% respectively. Whilst the decreasing size of the gap may be good news for fertility rates (female education and fertility rates being negatively correlated), the decrease in the proportion of males at secondary school is likely to be associated with the continuing high rates of urbanisation within the country.

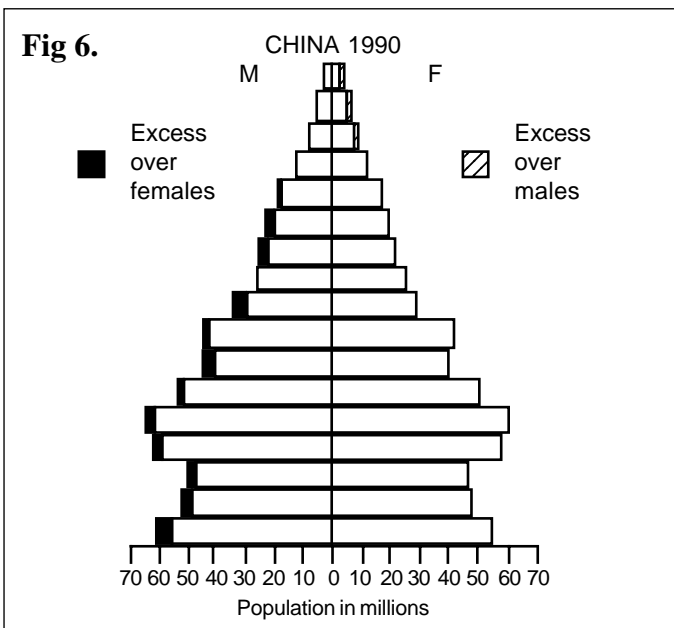
**Table 2. Nigeria
Vital Population Statistics**

	1990	2025
Population aged 10-24	38m	101m
Proportion of Population aged 10-24	32%	41%

Case Study: China

In 1996 China had a total population of 1,204 million people. A birth rate of 1.3% means that just over 12m babies are born annually and that 1 in 5 people on Earth live in China.

Exam Hint - In pursuit of Optimum Population, many countries have adopted birth control campaigns. Compare the measures taken in China (see Factsheet 4) to the population pyramid below.



Period	Number of school places needed for 5-9 yr olds
1971-1975	126 million
1976-1980	120 million
1981-1985	98 million
1986-1990	99.5 million
1991-1995	114 million

The requirements for school places from 1996 onwards cannot be calculated from this 1990 pyramid, since many of the relevant individuals would not have been born until 1991.

The implications of this age-sex structure are immense. Between 1971-1975 126m school places were needed for 5-9 year olds but this fell for the next 15 years before jumping again in the early 1990's

The main problems are as follows:

- Huge shifts in number of school places, hence buildings, teachers and other resources which are needed.
- Huge shifts in number of females of likely child-bearing age will make implementation of family planning policies very difficult.
- Even with the most draconian family planning policies, China is unlikely to be able to avoid having a total population of 1.5 billion for most of the twenty-first century.
- Proportion of elderly will inexorably increase especially in urban areas where the health care facilities are likely to become increasingly concentrated. This may further widen the gap in health provision which exists between rural and urban areas.
- Male: female imbalance at likely time of marriage will worsen, particularly if a one-child per family policy is implemented.

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